NPS Inventory and Monitoring Program

National Park Service
U.S. Department of the Interior

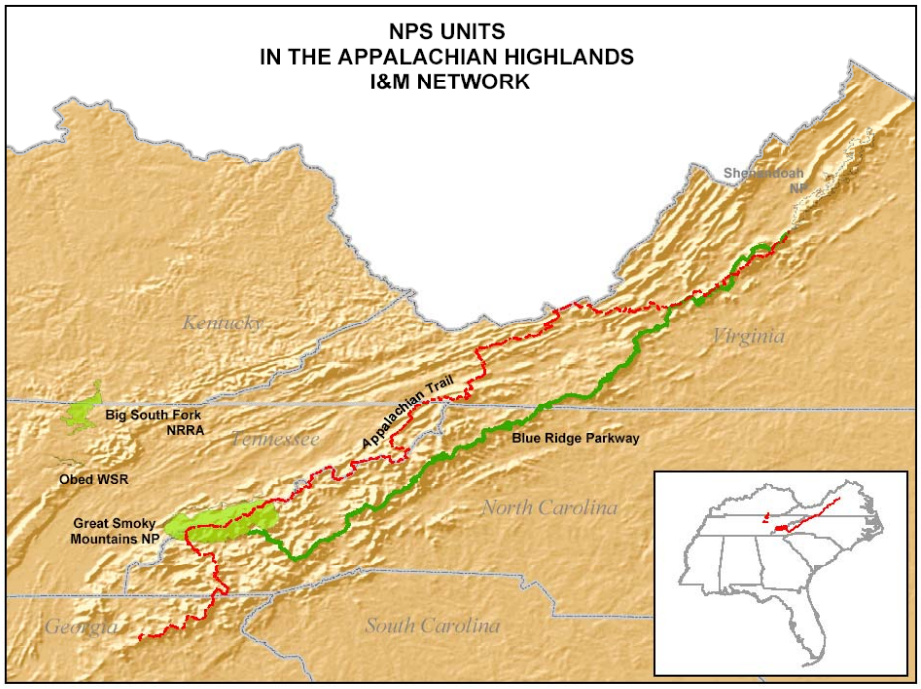
Appalachian Highlands Network Newsletter

Appalachian Trail, Big South Fork National River and Recreation Area, Blue Ridge Parkway, Great Smoky Mountains National Park, Obed Wild and Scenic River

Inventory and Monitoring gets Underway in Network Parks

INVENTORY AND MONITORING – WHAT IS IT, AND WHY ARE WE DOING IT?

The National Park Service's primary mission is to conserve unimpaired the natural and cultural resources and values of the national park system for the enjoyment of this and future generations. Preservation of healthy parks depends on acquiring accurate and timely information about the condition of natural resources, monitoring the change of conditions over time, and acting on that information with confidence. Because of a lack of resource knowledge in many parks, the 1998 National Parks Omnibus Management Act mandated a program to collect baseline information and to monitor long-term trends in the condition of the Parks' natural resources.



WHY NETWORKS?

It's not economically feasible to provide every park with a staff of scientists. Therefore, the 270 parks with significant natural resources have been organized into 32 networks based on geographic proximity and ecological similarity, sharing staff and resources. The Appalachian Highlands Network has two staff members thus far, stationed at the Blue Ridge Parkway. Robert Emmott is the network coordinator, and Nora Murdock is the network ecologist. They both report to the Southeast Regional Office and work for all five parks in the network.

WHAT INVENTORIES ARE BEING DONE?

Information is being collected in 12 basic data sets, including air and water quality, base cartography (GIS), weather data, geology, soil and vegetation maps for each park; as well as information about the distribution and relative abundance of vertebrates and vascular plant species. A web-based natural resource bibliography has been assembled for each park in an electronic database that will soon be available to all Park Service employees, as well as to the public (with the exception of some sensitive data).

WHAT ARE THE BENEFITS FOR THE PARKS?

☼ Vegetation maps

- Can identify **rare and unusual communities** that need special protection
- Can help direct **fuel reduction and wildfire control** efforts (certain species and types of vegetation can be extremely flammable and can turn a controlled fire into a dangerously hot one within a matter of minutes).
- Certain plants are indicative of hidden subsurface water (NOT a good place for construction).
- Certain species of trees are much more brittle than others and more likely to be toppled during wind and ice storms. Vegetation maps can help park managers predict potential problems and choose less dangerous sites for facilities.

☼ Geology

- Certain rock formations are prone to landslides; detailed geologic maps can help **eliminate hazards** to human safety, and **reduce maintenance problems and costs** by helping park managers predict where landslides will happen, and

(continued on Page 2, Column 1)

(Benefits for the Parks – continued)

where trees are more likely to fall during wind and ice storms. This information is also helpful for selecting safe sites for campgrounds, trails, and other facilities.

- **Acidic rock formations** found in the Appalachian Mountains and Cumberland Plateau **can poison fish and other aquatic organisms** in streams if the rocks are exposed by roadcuts or other excavations. Trees on these rock types are more prone to being wind-thrown. Problems can be avoided if detailed geologic maps are available to park managers.

- Many **rare species, both plant and animal, are associated with a particular geology or soil type**; detailed maps can help predict where these occur or indicate sites for restoration of those that may have been eliminated from a park.

☼ NPSPECIES database

- This electronic database is a **collection of all species data known for a park**, including specific locations for plants and animals, that can eventually be linked to a Geographic Information System to enable park managers to readily produce **distribution maps of rare species, wetland species and species with management significance (bats, migratory birds, etc).** This database will also contain detailed species accounts, describing what type of habitat is needed by species of concern and what types of disturbance are harmful to them, as well as what types of management are beneficial (fire, canopy thinning, etc.)

Progress Made:

VEGETATION MAPS – Aerial photography of all parks except Big South Fork has been completed. (Big South Fork will be photographed in 2003.) The University of Georgia will be preparing detailed vegetation maps for each park, using the aerial photographs and vegetation data being collected as part of the ongoing plant inventories. (a draft vegetation map for the Smokies should be complete by spring of this year)

PLANTS – Natureserve (an organization that was formerly part of The Nature Conservancy) is carrying out the plant inventories for the parks in both the Appalachian Highlands and Cumberland Piedmont Networks. At BISO, 80 percent of the inventory is complete; 40 percent of the plant inventory is complete for BLRI. Work will begin in the spring of 2003 at OBRI. To date, **roughly 48 species new to the parks have been found** (20 for BISO, 28 for BLRI), as well as **eight new populations of rare plants** on BLRI. Vascular plant inventories for the Smokies are complete. The Appalachian Trail has also completed plant inventories (focusing on rare species) for the portion of the trail in our network (VA, NC, GA, TN).

REPTILES AND AMPHIBIANS – Expert herpetologists will begin inventories of the network parks in the spring of 2003. **(During a recent inventory in the Smokies two amphibians, previously unknown in the park, were discovered.)**

BIRDS – Negotiations with contractors are still underway; bird surveys should begin in the spring of 2003.

GEOLOGY – A detailed inventory of the North Carolina section of the Parkway will begin in 2003; plans are underway for the US Geological Survey to begin mapping the Virginia section in the near future. A geologic inventory of the Great Smokies is underway; soils mapping of GRSM is approximately 40 percent complete. **Twenty new soil types, never before described, were discovered in the Smokies** during this project.

Freshwater mussels are an excellent indicator of good water quality. Only about fifty percent of the mussel species once known from the Big South Fork still occur there, including six federally Endangered species.

(Network Progess – continued)

WATER RESOURCES – We're working with the US Geological Survey in NC and TN to identify outstanding waters in the network parks, as well as those with significant pollution, and to design a long-term water quality monitoring program. The draft plan should be completed in 2004.

AIR QUALITY – We're working with the Air Resources Division to identify air quality problems within the network parks, and to design and implement additional air quality monitoring where it's needed. Ongoing monitoring in the Great Smokies has revealed significant ozone damage to plants at higher elevations; exposure to high levels of ozone can cause lung damage in people as well. (A study of the effects of high ozone concentrations on hikers at high elevations in the Park is underway).

Ongoing air quality monitoring in the Great Smoky Mountains National Park has revealed that some parts of the park have worse air qualtiy than large regional cities, such as Atlanta.

NPSPECIES DATABASE – We've entered nearly 10,000 new records of specimens that were collected from the network parks and are now housed in museums and herbaria, as well as records of species observed in the parks during past studies.

GEOGRAPHIC INFORMATION SYSTEM – We've assembled all of the available digital maps for the network parks, including topographic features, orthophoto quads, park boundaries, streams and lakes, landcover types (from satellite imagery), generalized soils maps, and elevation maps.

Assistance to other Networks

We've also been assisting the Cumberland Piedmont Network (CUPN) by finding contractors and negotiating agreements for their inventories of vertebrates and vascular plants. We've developed cooperative agreements for inventories in eight of the CUPN Parks. All of the aerial photography has been completed for the 14 CUPN parks, and vegetation maps have been drafted for three parks. Vegetation inventories have been completed for five of their parks under our combined cooperative agreement for both networks.

National Park Service
U.S. Department of the Interior

Appalachian Highlands Inventory and Monitoring Network
c/o Blue Ridge Parkway
199 Hemphill Knob Road
Asheville, North Carolina 28803

Phone
828-271-4779 ext. 312

E-mail
Robert_Emmott@nps.gov
Or Nora_Murdock@nps.gov

The National Park Service cares for the special places saved by the American people so that all may experience our heritage.

LONG-TERM MONITORING

Knowing the condition of natural resources in national parks is fundamental to the Service's ability to manage park resources "unimpaired for the enjoyment of future generations". National Park managers are confronted with increasingly complex and challenging issues that require a broad-based understanding of the status and trends of park resources. Protecting and managing a park's natural resources requires a multi-agency, ecosystem approach because most parks are open systems, with threats such as air and water pollution, or invasive species, orginating outside the park's boundaries. Understanding and effectively managing a resource may require a regional, national or international effort. A long-term monitoring program is being designed to identify links between changes in resource condition and the causes of those changes, to provide an early warning of impending threats to the integrity of the parks' ecosystems, as well as to promote public understanding of park resources.

Because we obviously cannot afford to monitor all natural resources in the parks, the intent of the NPS monitoring program is to track a subset of park resources and processes, known as "vital signs", that are determined to be the most significant indicators of ecological condition of those specific resources that are of the greatest concern to each park.

To identify these "vital signs", we're holding workshops involving park managers and scientists from natural resource disciplines, as well as managers from other agencies like the US Forest Service, Natural Resources Conservation Service, US Fish and Wildlife Service and US Geological Survey. We've also sent out questionnaires to each division within the network parks, asking them to identify their greatest information needs. By the fall of 2003, we will have identified and prioritized a list of vital signs to be monitored. The next step will be to develop the most efficient and cost-effective techniques for monitoring those indicators.